

DRAFT

ENGINEERING SERVICES
CONTRACT (ESC)

PERFORMANCE WORK
STATEMENT (PWS)

June 03, 2009

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1.0 OVERVIEW

1.1 Objective

This Performance Work Statement (PWS) and all documents attached or referenced herein define the Government's requirements for the Contractor to provide engineering products and services for the National Aeronautics and Space Administration (NASA) at the Kennedy Space Center (KSC). This PWS describes the general scope of work. All work pursuant to Sections 4 through 7 will be authorized by Task Orders issued in accordance with the terms of the Contract.

The Contractor shall provide NASA/KSC with services that are safe, reliable, and affordable while ensuring a healthy work environment that minimizes risk and maximizes mission success. The Contractor is responsible and accountable for achieving the required results based upon their approach, their internal processes, and compliance with NASA/KSC procedural requirements.

1.2 Scope

The Contractor shall perform work within the following range of activities:

- Laboratories and Developmental Shops – Operate and maintain assigned laboratories and developmental shops.
- Engineering Development – perform design & development of ground systems and equipment for handling, test, checkout, servicing and other ground processing of launch vehicles and spacecraft/payloads.
- Space Flight Systems Sustaining Engineering Support – provide engineering and analysis support to NASA-led activities during the sustaining lifecycle phase of launch vehicle and spacecraft/payload systems and subsystems.
- Operations Technology Development – perform research & development of technologies that address operations needs for immediate response, life cycle cost reduction, and future operations.
- Technical Services – provide cross-cutting services supporting the performance of the above work.

1.3 Joint Occupancy

Joint Occupancy means that there may be other contractors or NASA employees utilizing the same facilities/laboratories/developmental shops during a particular schedule period. This is an intermittent condition and may affect one or more facilities/laboratories/developmental shops at any particular time. Notice will be provided by NASA/KSC to the contractor prior to a joint occupancy condition and NASA/KSC will have the responsibility for resolving schedule conflicts.

1.4 Data Deliverables

The contractor shall provide those plans, procedures, data, and reports identified and described in the Data Requirements List (DRL) specified in Appendix A. The Contractor shall submit data in electronic format whenever practical.

1.5 Performance Surveillance

NASA/KSC will monitor and evaluate the Contractor's performance in accordance with procedures set forth in the Contract Performance Surveillance Plan, Attachment J-X.

2.0 MANAGEMENT AND ADMINISTRATION

The Contractor shall perform and integrate business and administrative functions to successfully perform the requirements of this contract. Management and administration activities include, but are not limited to, the areas described in this PWS section.

The Contractor shall provide and maintain contract management systems for planning, organization, implementation, direction, control and reporting of all activities at all locations required by this contract. These systems shall be adequate to ensure accomplishment of project safety, technical, schedule, and cost objectives.

The Contractor shall provide a Contract Management Plan (DRXXX) which defines and integrates contract work activities and requirements across the contract, including subcontractor efforts. The contractor's management structure shall fully integrate all related plans, including those of first-tier subcontractors.

The Contractor shall provide and maintain a management system capable of capturing and reporting the data required to develop and maintain the following DRs.

(DRXXX), Advance Notification of Workforce Reductions Report

(DRXXX), Quarterly Contractor Workforce Report

(DRXXX), Quarterly Summary of 3rd Step Grievances and Arbitrations Report

The Contractor shall provide and maintain an Electronic Work Breakdown Structure (WBS) in accordance with Work Breakdown Structure and Dictionary (DRXXX). This WBS shall serve as the framework for contract planning, budgeting, cost reporting and schedule status reporting to NASA/KSC.

The Contractor shall institute and maintain an effective, efficient, and responsive management organization responsible for management and oversight of Contractor personnel, other contract resources, contract performance, deliverables, and cost.

The Contractor shall promptly alert the Contracting Officer's Technical Representative (COTR) and the Contracting Officer (CO) of any problems that may adversely impact the timely, cost-effective, and safe delivery of quality products and services under this contract.

2.1 Management Control Functions and Continuous Improvement

The Contractor shall perform contract management control functions including:

- Developing and implementing policy and planning consistent with agency, program and center directives, policies, operating procedures and requirements.
- Assessing and reporting performance to plan.
- Managing contract efforts to meet technical, cost, schedule, and safety requirements.
- Establish a process for developing, updating and tracking Memoranda of Understanding (MOUs), Memoranda of Agreement (MOAs), Associate Contractor Agreements (ACAs) and agreements with other contractors.
- Developing and tracking metrics and other data to measure the overall contract performance and progress.
- Coordinating lessons learned and implementing resultant findings.

The Contractor shall utilize existing standardized plans, practices, policies, procedures, and agreements jointly developed and used by contractors, government personnel and customers, for ongoing work transitioned from other contracts to ESC. The Contractor shall comply with these existing plans, practices, policies, procedures and agreements until ongoing work transitioned from other contracts to ESC is completed, modified or terminated.

The Contractor shall revise all existing plans, practices, policies, procedures and agreements to reflect strategies for mission success and operational efficiency and shall make any necessary corrections or revisions within one year of contract start. The Contractor shall exercise judgment when proposing modification or cancellation of existing plans, practices, policies, procedures, understandings and agreements to ensure mission success. The Contractor shall obtain NASA/KSC approval for modifications or cancellations to existing plans, practices, policies, procedures and agreements. Understandings and agreements between the Contractor and other contractors do not require NASA/KSC approval.

The Contractor shall develop, implement and maintain continuous improvement activities for the duration of this contract as documented in the Quality Plan with the overarching goals of improving productivity, streamlining processes, achieving cost savings, and achieving other economies and efficiencies across the full spectrum of performance of this contract and the performance of subcontractors.

The Contractor shall document lessons learned in the NASA Lessons Learned Information System (LLIS) database in accordance with NPR 7120.5, NASA Space Flight Program and Project Management Requirements, NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping, and NPR 7120.6, Lessons Learned Process.

The Contractor shall participate in the following types of meetings and reviews:

2.1.1 Contracting Officer and Technical Representative Meeting

The Contractor shall attend weekly meetings to discuss contract issues, process improvements, risk factors and related issues, corrective actions, and other details of contract operations. These informal meetings will normally be attended by the NASA/KSC Contracting Officer, the Contracting Officer's Technical Representative, Technical Representative(s), and Resources Management Office representative(s).

2.1.2 Monthly Senior Management Meetings

Senior Contractor personnel shall attend informal monthly meetings with NASA managers to discuss accomplishments, problems, risk factors and related issues, corrective actions, and other details of contract operations.

2.1.3 Quarterly Contract Review Meeting

The Contractor shall present a quarterly contract review to NASA/KSC in accordance with its Contract Management Plan. Content of these reviews shall include: technical issues and accomplishments, analysis of cost and schedule performance data, and a contract performance overview consistent with the data contained in the Quarterly Contract Performance Management Report (DRXXX).

2.2 Risk Management

The Contractor shall develop and implement management approaches (including the criteria, methods, and procedures) for identifying, analyzing, planning, tracking, mitigating, communicating, and documenting ESC-related risks associated with:

- Contract Transition/Phase-In
- Contract Administration
- Performance of PWS Requirements
- Accomplishment of Task Orders
- Annual Staffing Plans vs. Projected Workloads

The Contractor shall develop, implement, and update a Risk Management Plan (DRXXX) in accordance with NPR 7120.5, NASA Space Flight Program and Project Management Requirements (Section 4.2, Risk Management) and NPR 8000.4, Agency Risk Management Procedures and Guidelines. The Risk Management Plan shall provide an organized, systematic decision making process that efficiently manages risks associated with the ESC at NASA/KSC.

2.3 Performance Management System

A Performance Management System (PMS) is an electronic system capable of producing and retrieving digital information required for the execution of tasks as

well as the capture and archival of data produced by NASA/KSC and contract operations.

The Contractor shall implement, update and maintain an electronic, integrated PMS with capabilities for planning, authoring, controlling, scheduling, integrating, approving, documenting, tracking and monitoring contract activities.

The Contractor shall define specific metrics and how those metrics correlate to specific contract requirements. In addition, the contractor's performance management system shall define specific measurements of management effectiveness. Performance measurement reporting is also required on subcontracts that (based upon risk, schedule criticality, or dollar value) have the potential to impact the successful fulfillment of this contract.

The Contractor shall develop, maintain, and report safety, cost, schedule, and technical performance metrics, which effectively indicate the level of the contractor's performance against the contract requirements. A summary of this report shall be provided at the quarterly contract review.

The Contractor shall provide NASA/KSC direct electronic access to the contractor PMS system. Technical issues and accomplishments, analysis of cost and schedule performance, and corrective actions in problem areas shall be provided. The PMS shall include the capability to report Earned Value Management, as required.

The Contractor shall accept, operate and maintain legacy hardware, databases, software and systems, that may be required to support the initial performance of contract requirements. The Contractor shall maintain data transfer capability of legacy systems, assess legacy IT hardware and software for future use, and develop and implement a plan to transition those hardware and software assets determined to have beneficial future use into an integrated PMS capable of supporting all requirements of this contract. Details on existing hardware and software systems that will transfer are located in Attachment J-XX (Government Furnished IT Systems).

The Contractor shall operate a user help desk for Contractor managed IT systems. This help desk shall provide services to the Contractor, Government and other users who require access to Contractor managed IT systems. The Contractor shall maintain a problem tracking system as part of the help desk function. The Contractor shall report to the initiator when the problem is resolved.

Note: NASA/KSC will make available a Government-provided Maximo Workflow and Asset Management software application. The bidder's library will contain a description of the system including specifications of the hardware and software platforms, license information, and associated support infrastructure. Offerors can decide whether to include the use of the licenses and infrastructure within their proposal.

NASA/KSC will also make available the use of a government owned system; Management Information Decision Analysis System (MIDAS). MIDAS utilizes a suite of automated administrative systems to manage project costs and planning. The custom developed open system integrates the scheduling, resource management, budget planning, and Task Order systems with the cost accounting systems to provide a seamless top down project management system. MIDAS is a WEB based data warehouse system that supports Performance Based Contract (PBC) requirements and Earned Value Management (EVM) objectives. The Contractor may also choose to use a combination of these systems. The Contractor may utilize externally hosted applications as part of the proposed solution if compliant with NASA/KSC IT policies and regulations in Attachment J-XX (Applicable Documents) regarding external systems. The Contractor must address end of contract transition cost and data ownership and transfer issues. Details on existing hardware and software systems that will transfer are located in Attachment J-XX (Government Furnished IT Systems).

2.4 Financial Management

The Contractor shall provide monthly and quarterly accumulated expenditures and projections of program costs and workforce utilization in accordance with Contractor Financial Management Analysis, NASA Form 533M and NASA Form 533Q Report (DRXXX), including all first tier subcontractors and other subcontractors with annual expenditures of \$1,000,000 or more or with total contract value of \$1,000,000 or more. The Contractor shall manage this contract in a manner that ensures all requirements are accomplished and accounted for in accordance with all applicable agency and federal procedures and regulations. The Contractor shall develop, recommend and implement approaches consistent with government regulations that support and expedite the contract change process.

The Contractor shall develop and submit integrated technical cost and schedule data, consistent with Government budget schedules, financial planning as required to support the government budget process to include but not limited to multi-year Planning, Programming, and Budget Execution (PPBE) calls, annual operating plan calls, Information Technology (IT) budget calls, as well as task proposals/status and special or ad hoc requests for budget impacts. The format and content of the Contractor's inputs and supporting rationale shall be in accordance with the budget or special request guidelines, and formats specified by the government.

The Contractor shall provide an automated, network accessible, ad hoc query capability to permit specific Government users, as identified by the Government, access to determine the cost, schedule and status of work at the level of detail reported in individual work orders, specific customers, unique projects, WBS and NASA Form (NF) 533 reports. The tool shall be able to archive and reproduce all historical financial data for the duration of the contract.

The Contractor shall utilize and maintain a financial management system with adequate internal checks, balances and audit steps to isolate and identify erroneous or incomplete data and procedural deviations. The system shall be flexible to ensure compliance with the variety of cost charging and reporting requirements of the Government based on category of customer and sources of funds. The Contractor shall notify the Government immediately upon detection of significant errors in their accounting system that impact work and/or costs reported in any given period.

The Contractor shall participate in financial reviews with the Government to discuss cost planning, phasing and performance to provide insight into the overall progress of the Contractor, subcontractors and vendors. These reviews may include both formal and informal discussions with multiple customers requiring multiple products/reports, sometimes due concurrently. The Contractor shall provide a recovery plan for any task, activity or project for which the Contractor has responsibility when the estimate exceeds predetermined established cost or schedule plans.

The Contractor shall develop and maintain the following financial data requirements.

DRXXX Contractor Financial Management Analysis, NASA Form 533M & NASA Form 533Q Reports

DRXXX, e533 Flat File

DRXXX, Annual Phased Contract Operating Plan

DRXXX, Rate-Volume Variance Analysis Report

DRXXX, Direct and Indirect Rates Report and Review

DRXXX, Prime and Subcontractor Contract Value (CV) Status Report and Review

DRXXX, Annual IT NASA Headquarters and Special IT Budget Report

The Contractor shall reconcile and periodically audit all data contained in the data requirements list to the Contractor's financial management systems.

2.5 Records and Data Management

The Contractor shall develop, maintain and implement a Records Management Plan (DRXXX) in accordance with NPD 1440.6, NASA Records Management, NPR 1441.1, NASA Records Retention Schedules, and KNPD 1440.1, KSC Records Management Programs.

The Contractor shall manage Government-owned, Contractor-held records, including legacy Federal records (data created for Government use and delivered to, or falling under the legal control of, the Government) inherited from predecessor contractors. The Records Management Plan shall include provisions for Government electronic on-line access to contractor management systems including access and interface requirements.

The Contractor shall provide NASA/KSC with any training required to access and use these systems and shall transfer Government owned data to the Government at the completion or termination of this contract.

2.6 Environmental Compliance

The Contractor shall ensure that activities affecting the environment are in compliance with applicable federal, state, and local environmental laws, regulations, and executive orders; NASA Headquarters directives in accordance with NPD 8500.1, NASA Environmental Management, and NPR 8570.1, Energy Efficiency and Water Conservation.

The Contractor shall meet NASA environmental, natural resource and cultural requirements in accordance with KNPR 8500.1, KSC Environmental Requirements.

The Contractor shall meet NASA's Sustainable Acquisition Program for procurements in accordance with NPR 8530.1, Affirmative Procurement Program and Plan for Environmentally Preferable Products.

The Contractor shall support NASA's Environmental Management System in accordance with NPR 8553.1, NASA Environmental Management System, (EMS), including environmental management plans, targets and objectives consistent with KSC-PLN-1912, KSC Environmental Management System (EMS) Plan.

The Contractor shall develop and maintain an Environmental Management Plan (DRXXX) which defines the Contractor's internal policies, procedures, and guidelines for environmental compliance.

The Contractor shall ensure that all employees who are responsible for hazardous waste management activities receive annual hazardous waste training and, where applicable, have job descriptions that meet the requirements of 40 CFR 265.16.

The Contractor shall incorporate sustainable elements and practices in operations in accordance with Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, including areas of energy efficiency, use of renewable energy, reduction in water consumption intensity, acquisition of green products and services, pollution prevention, waste prevention, recycling and waste diversion, use of alternative fuel vehicles and alternative fuels and electronic stewardship.

2.7 Emergency Preparedness

The Contractor shall develop, update and implement an Emergency Preparedness Plan (DRXXX) in accordance with KNPR 8715.2, Comprehensive Emergency Management Plan. This plan shall integrate the Contractor's approach to emergency preparedness, response and recovery to provide a safe work environment for the employees.

The Contractor shall support the Damage Assessment Review Team (DART) as directed by the NASA/KSC Emergency Preparedness Officer upon "Weather Safe" call.

2.8 Information Technology Management and Security

The Contractor shall provide all data and IT systems necessary to perform the requirements of this contract with the exception of the items listed in Attachment J-XX (Government Furnished Services). Necessary data and IT systems include: hardware; systems and application software; test application software, firmware, displays, databases and data storage systems.

The Contractor shall comply with NPR 7150.2, NASA Software Engineering Requirements, and NPR 7120.7, NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements.

The Contractor shall develop, update and implement an IT Plan (DRXXX) in accordance with NPD 2800.1, Managing Information Technology.

The Contractor shall ensure IT Security compliance for IT systems that generate, access, store or process NASA information, regardless of whether the information resides on a Government-furnished or a Contractor-provided IT system. The Contractor shall establish, maintain, and implement an IT System Security Plan (DRXXX) for all systems developed, processed or operated in performance of this contract, in accordance with NPR 2810.1, Security of Information Technology and NPD 2810.1, NASA Information Security Policy. New systems shall be compliant prior to authorization to operate. Existing systems inherited from predecessor contractors shall be compliant within 30 days after contract award.

The Contractor shall adhere to NASA annual Federal Information Security Management Act (FISMA) reporting metrics, including annual IT Security Awareness Training and IT System Security Plan (ITSSP) contingency plan testing and continuous monitoring of ITSSP security controls for adequacy and compliance.

The Contractor's office desktop computer needs will be provided as a Government-furnished service. Any desktop software tools used by the Contractor must comply with NASA STD 2804 (Minimum Interoperability Software Suite) and NASA STD 2805 (Minimum Hardware Configurations).

The Contractor shall ensure that NASA/KSC directories are kept up to date for all Contractor staff located at NASA/KSC and remote sites.

2.9 External Relations

The Contractor shall conduct laboratory tours and interviews requested by NASA/KSC. The Contractor shall generate and coordinate news releases with the NASA/KSC External Relations Office, where appropriate.

2.10 Safety & Health

The Contractor shall protect the public, NASA/KSC team members, equipment, and property (including the environment) from potential harm resulting from Contractor activities and operations. The Contractor shall assure mission success through safe, reliable and high-quality processes and products.

The Contractor shall comply with the NASA-managed safety program for Pressure Vessels and Pressure Systems in accordance with NPD 8710.5, Policy for Pressure Vessels and Pressurized Systems.

The Contractor shall develop, update and implement a Safety and Health Plan (DR XXX) in accordance with NPR 8715.3, NASA General Safety Program Requirements (Appendix E) and KNPR 8715.3, KSC Safety Practices Procedural Requirements.

2.10.1 System Safety

The Contractor shall perform, maintain and provide hazard analysis in accordance with KNPR 8700.2, KSC Ground Systems Safety and Reliability Analyses. These analyses must be submitted for review and approval to NASA/KSC Safety and Mission Assurance.

The Contractor shall develop and implement a process which ensures the identification of hazards; elimination or risk reduction of hazards; and updates of hazard documentation throughout the life cycle of systems, equipment and operations under the responsibility of the Contractor.

The Contractor shall coordinate and support the incorporation of risk products identified in the system safety and reliability analyses performed under this Contract into the ground operations hazard analysis prepared by other KSC support contractors.

2.10.2 Occupational Safety

The Contractor shall monitor, consistent with their Safety and Health Plan, activities to ensure compliance with NASA, Occupational Safety and Health Administration (OSHA), and other local, state or federal regulatory agency requirements.

The Contractor shall protect employees from workplace injury and/or illness in accordance with KNPR 8715.5 KSC Personal Protective Equipment (PPE) Program Procedural Requirements.

The Contractor shall submit a Safety Statistics Record (DRXXX) in accordance with KNPR 8715.3.

2.11.2.1 Voluntary Protection Program Compliance

The Contractor shall establish a Safety and Health Program throughout all organizations of the contract including first tier subcontractors to comply with the Occupational Safety and Health Administration (OSHA) Voluntary Protection Program (VPP) Star Program requirements per VPP Application (DRXXX).

The Contractor shall provide a corporate assessment team to conduct an OSHA VPP Star compliance review 18 months after the contract effective date. The Contractor shall provide KSC/NASA with the list of members' names and schedule.

The Contractor shall demonstrate OSHA VPP Star Program compliance throughout all contract organizations within 24 months after contract effective date. The Contractor shall provide a copy of the Compliance Certification to KSC/NASA.

2.11.2.2 Mishap Investigations and Reporting

The Contractor shall establish processes for reporting and investigating mishaps in accordance with KDP-KSC-P-1473 (KSC Mishap Reporting and Investigating) and KDP-KSC-P-2111 (Reporting Close Calls).

2.10.3 Operational Safety

The Contractor shall develop and implement a process in which testing, operations, and maintenance activities are assessed for hazards, in accordance with KNPR 8715.3. The process shall provide for hazardous operation surveillance, hazardous procedure review, and risk assessments associated with deviations from procedures or safety and health requirements.

2.10.4 Industrial Hygiene

The Contractor shall develop, update and implement an industrial hygiene process, as documented in the Safety and Health Plan, in accordance with the requirements of KNPB 1800.2 (KSC Hazard Communication Program), KNPR 1840.19 (KSC Industrial Hygiene Program), KNPR 1820.3 (KSC Hearing Loss Prevention Program), and KNPR 1820.4 (KSC Respiratory Protection Program). Administrative management of the Contractor's industrial hygiene process shall be under the oversight of an Industrial Hygienist.

2.10.5 Health Physics

The Contractor shall develop, update and implement a health physics process, as documented in the Safety and Health Plan, in accordance with the requirements of KNPB 1860.1 (KSC Radiation Protection Program), KNPR 1860.1 (KSC Ionizing Radiation Protection Program), KNPR 1860.2

(KSC Nonionizing Radiation Protection Program), and the requirements of the Nuclear Regulatory Commission. All potentially hazardous ionizing and non-ionizing radiation sources shall be under Radiation Use Authorizations in accordance with KNPR 1860.1 and KNPR 1860.2.

2.11 Reliability & Quality Assurance

The Contractor shall develop and implement a process which ensures the reliability and quality throughout the life cycle of the systems and equipment for which the Contractor is responsible.

2.11.1 Reliability

The Contractor's process shall include assessments of reliability of systems and equipment for which the Contractor is responsible in accordance with KNPR 8700.2, KSC Ground Systems Safety and Reliability Analyses.

The Contractor shall prepare, maintain, control and submit, for NASA/KSC Safety and Mission Assurance approval, the Failure Modes Effects Analysis (FMEA)/Critical Items List (CIL) in accordance with KNPR 8700.2.

The Contractor shall integrate the results of the reliability assessments with the systems safety function of risk identification.

2.11.2 Quality

The Contractor shall develop and implement a management system and Quality Plan (DRXXX) which is compliant to the requirements of SAE AS 9100, Quality Management Systems – Aerospace -- Requirements, within 12 months of contract start.

The Contractor shall provide quarterly progress reports regarding documenting, developing and implementing their management system to comply with SAE AS 9100. The Government or third party will assess the Contractor's implementation for compliance and the Contractor shall adequately address identified discrepancies within 6 months of release of auditor's findings.

The Contractor shall assure trained and, where required, certified and licensed personnel perform work; verify work is performed per written procedures; and assure tools, equipment and resources are appropriate for the activity.

The Contractor shall utilize tools, equipment and measurement systems in compliance with KNPR 8730.1, KSC Metrology and Calibration Procedural Requirements.

The Contractor shall develop and implement a Foreign Object Debris (FOD) Program in accordance with KNPR 8730.2, KSC Quality Assurance Procedural Requirements.

2.11.3 Government Industry Data Exchange Program (GIDEP)

The Contractor shall participate in the Government Industry Data Exchange Program (GIDEP) in accordance with GIDEP SO300-BT-PRO-010 (GIDEP Operations Manual), SO300-BU-GYD-010 (GIDEP Requirements Guide), and NPR 8735.1 (Procedures for Exchanging Parts, Materials, and Safety Problem Data Utilizing Government Industry Data Exchange Program and NASA Advisories).

The Contractor shall review GIDEP ALERTS, GIDEP SAFE-ALERTS, GIDEP Problem Advisories, GIDEP Agency Action Notices, and NASA Advisories to determine if they affect the Contractor's products and services provided to the NASA/KSC.

The Contractor shall take action to eliminate or mitigate any negative effect resulting from review of alert system documentation.

2.11.4 Software Safety and Assurance

The Contractor shall develop, update and implement a software safety and assurance process in accordance with KNPR 8750.1, KSC Software Assurance Requirements.

2.11.5 Safety and Mission Assurance Reviews

The Contractor shall support Safety and Mission Assurance activities associated with reviews, panels, boards, and working groups. Activities include:

Presentation of results associated with Safety and Mission Assurance products (e.g. hazard analyses, failure mode and effect analyses, and risk assessments); Documentation of waivers, deviations and exceptions that are submitted to gain Government approval for review and impact of proposed changes to applicable NASA, Federal, State, and local laws, regulations, policies, and directives as well as industry standards.

2.12 Security Management

The Contractor shall develop, update and implement a Security Management Plan (DRXXX), in accordance with NPD 1600.2 (NASA Security Policy), NPR 1600.1 (NASA Security Program Procedural Requirements), NPR 1371.2 (Procedural Requirements for Processing Requests for Access to NASA Installations or Facilities by Foreign National and U.S. Citizens who are Representatives of Foreign Entities), and Department of Defense (DoD) 5220.22 (National Industrial Security Program Operating Manual).

The Contractor shall comply with NPD 1660.1 (NASA Counterintelligence (CI) Policy) and NPR 1660.1 (Counterintelligence/Counterterrorism (CT) Procedural Requirements).

2.13 Information Protection

The Contractor shall develop, update, and implement an export control compliance program and Export Control Plan (DRXXX) in accordance with NPD 2190.1, NASA Export Control Program. The Contractor shall identify an Export Control Plan focal point that will be the Contractor's representative to support the KSC Export Control Working Group.

The Contractor shall ensure that all designated Sensitive But Unclassified (SBU) materials are encrypted for electronic transfer.

The Contractor shall comply with 15 CFR Parts 730-774, Commerce and Foreign Trade, and 22 CFR Parts 120-130, International Traffic in Arms Regulations (ITAR).

The Contractor shall implement privacy information protection in accordance with NPD 1382.17 (NASA Privacy Policy) and NPR 1382.1 (NASA Privacy Procedural Requirements).

3.0 LABORATORIES AND DEVELOPMENTAL SHOPS OPERATIONS AND MAINTENANCE

The Contractor shall operate and maintain assigned laboratories and developmental shops as defined in Appendix C.

The Contractor shall provide primary operations and maintenance of assigned laboratories, developmental shops, and associated space in accordance with KNPR 8830.1, Facilities and Real Property Management Procedural Requirements.

The Contractor shall ensure personnel safety and operational readiness while controlling costs and operational risks.

Laboratory capabilities shall support resident laboratory locations or in-situ such as KSC, Cape Canaveral Air Force Station (CCAFS), and Patrick Air Force Base (PAFB), and other entities as assigned. Laboratory capabilities shall include any or all of the following: material properties, biology, metrology, physical sciences, information technology/communications, electrical/electronic and support to payload development and experiments.

The Contractor shall develop and maintain a laboratory capabilities document, such as Appendix XX.

The Contractor shall manage and integrate equipment usage among assigned laboratories and developmental shops to ensure efficient utilization of resources.

The Contractor shall identify efficiencies for assigned laboratories to the NASA/KSC Technical Representative, COTR, and CO. The efficiencies may involve consolidating like capabilities, functions, equipment or space. The efficiencies may also involve changes in scalability for technical and/or throughput capabilities. Proposals should include return on investment, costs, and execution plan that ensures a seamless transition.

The Contractor shall obtain prior approval of the Government before establishing additional laboratories and developmental shops per KDP-KSC-P-2779, KSC New Laboratory Creation Process.

The Contractor shall utilize a web-accessible work control system for tracking, trending, and reporting. The Contractor shall provide the Government with work control system access. A customized Government furnished Work Control System (WCS) is available for use.

The Contractor shall make all laboratories and developmental shop equipment available to trained, qualified, or certified (as required) NASA personnel.

The Contractor shall develop and maintain laboratory and developmental shop policies, procedures, chemical hygiene plans, safety plans, training materials, safety materials, equipment performance, and equipment usage in accordance with KNPD 1440.1, KSC Records Management Programs.

The Contractor shall identify, acquire, and manage the necessary supplies, equipment, consumables, and other items necessary to sustain the functional capabilities and activities within the laboratories and developmental shops.

The Contractor shall maintain documentation of supplies, equipment, and consumables to include annual hardware/software maintenance costs, calibration costs, expected equipment life, projected equipment replacement costs, and consumables costs in accordance with KNPD 1440.1.

The Contractor shall provide preventative, routine, and reparative maintenance for property associated with laboratory and developmental shop systems.

The Contractor shall maintain, troubleshoot, and repair all assigned equipment. This shall include: custodial care and property management of assigned laboratory and developmental shop equipment; housekeeping, collection, management, and disposal of all laboratory/development shop generated waste; and inventory maintenance, tracking and scheduling routine maintenance and calibration.

The Contractor shall prepare and update existing Periodic Maintenance Instructions (PMIs) and, as required, recommend replacement or upgrade of assigned equipment.

The Contractor shall maintain applicable accreditations and Internal Operating Procedures (IOPs) to assure safe laboratory and developmental shop operations.

The Contractor shall maintain a calibration program in accordance with KNPR 8730.1, KSC Metrology and Calibration Procedural Requirements.

The Contractor shall perform the timely inspection, calibration, certification, and tracking of equipment and systems located in laboratories and developmental shops identified in Appendix C. This may involve in-situ calibration or pick-up and delivery.

The Contractor shall provide a single point of contact for emergency response to critical activities in the Contractor assigned areas.

4.0 ENGINEERING DEVELOPMENT

The Contractor shall provide engineering services and support for current and future NASA Programs at KSC.

The Contractor shall provide engineering hardware and software products for specific mission requirements of current and future NASA Programs at KSC. These products and services are primarily focused on systems and equipment to be used for vehicle processing, payload processing, launch and recovery, and supporting activities. Deliverable end items may include operational ground systems and ground support equipment (as defined in NASA-STD-5005, Standard For The Design And Fabrication Of Ground Support Equipment), prototypes, mockups, test articles, training systems, laboratory test equipment, and research instruments. Tasks include: requirements definition and management, technology assessment, trade studies, concept development, design, fabrication and assembly, integration, testing, analysis, installation, documentation, delivery and sustaining engineering.

The Contractor shall provide skills in specialty areas such as propellants, gases, electrical power, systems engineering and integration, reliability, human factors, cryogenics, hypergolic, pneumatics, hydraulics, fiber optics, communication systems, information technology security systems, sensors, instrumentation, hazardous gas detection, intelligent systems, modeling and simulation, computer hardware, software, networking, control systems, mechanical systems, structures, stress and load analyses, vibroacoustic analyses, thermal analyses, computational fluid dynamics, data analyses, industrial engineering, materials science, electronic design, data acquisition, metrology, and atmospheric science. Tasks will require the use and knowledge of current state-of-the-art design techniques as well as aerospace design practices that were applied to existing ground systems. It is expected that these established practices will be improved upon using application of new technologies to satisfy future requirements.

The Contractor shall meet the requirements of NPR 7123.1, NASA Systems Engineering Processes and Requirements, for the design and development of systems. Software produced under this contract shall be developed, documented and maintained in accordance with NPD 2820.1 (NASA Software Policies) and NPR 7150.2 (NASA

Software Engineering Requirements) and controlled in accordance with the data rights provisions of the contract.

4.1 Trade Studies

The Contractor shall perform concept and design trade studies to recommend technical, cost, and schedule approaches to fulfill establish requirements. Technical assessments shall establish or determine impacts to: schedules, processes, procedures, performance, safety, environment, reliability, operability, hardware, software, and maintainability.

4.2 Requirements

The Contractor shall coordinate with the NASA/KSC for determination of technical, cost, and schedule requirements.

The Contractor shall use change management processes and tools as defined by the NASA programs to track and implement changes to baseline requirements.

The Contractor shall prepare technical assessments and evaluations of requirements to include an implementation cost estimate, installation and testing requirements, and any necessary trade studies.

4.3 Design

The Contractor shall prepare complete design packages or parts thereof. A complete design package is defined as the technical effort required to convert preliminary designs or conceptual engineering into the drawings and specifications necessary for procurement, fabrication, installation, operation, and maintenance of new or modified systems and equipment. In addition to drawings and specifications, a complete design package contains additional products as listed in KDP-P-2713, Technical Review Process. All design engineering tasks shall be accomplished in accordance with KSC-DE-512-SM (Facility, System, and Equipment General Design Requirements), NASA STD 5005 (Standard For The Design And Fabrication Of Ground Support Equipment), and/or with Program provided design requirements documents.

The Contractor shall participate in design reviews during the design process and prior to engineering release to assure performance, safety, quality, maintainability, and reliability requirements are incorporated in the design package. Design Reviews are conducted in accordance with defined NASA/KSC and program requirements, and in accordance with KDP-P-2713. Depending on NASA/KSC requirements, the design reviews may be informal periodic design team meetings, 30/60/90% reviews, or the formal programmatic Preliminary Design Review, Critical Design Review, and Design Certification Review (typically required for critical safety or high-energy systems).

4.4 Proof of Concept Prototype

The Contractor shall develop proof of concept prototypes for laboratory testing, field testing and demonstration of the technical feasibility of components, assemblies, subsystems, and complete products.

4.5 Fabrication and Assembly

The Contractor shall perform and document make or buy recommendations for fabrication of parts, assemblies, subsystems, end item components, unique test fixtures and test articles. Fabricated parts, assemblies, subsystems and end items shall be specified and manufactured to aerospace standards, as directed in KSC, program, and NASA requirements documents.

4.6 Testing

The Contractor shall provide support for design of equipment, fixtures, and tooling required for testing, handling, or build-up.

The Contractor shall support, perform, and/or develop test requirements, plans and procedures as required for:

- Verification testing conducted on components, subassemblies and the final assembled product
- Validation and acceptance testing after turn over to operations and maintenance organizations
- Engineering development products, and operations technology investigations.

Specific activities may include test planning, scheduling, coordinating, test set-up activation and modification, test conduct, defining requirements for data acquisition, recording and evaluation, and test reporting. Test reports will document whether parts or systems meet requirements. Test reports shall also include test configuration, equipment used, test methodology, test data, analysis of test results, appropriate recommendations and conclusions that may be derived from the testing.

For certification, an acceptance test procedure (ATP) of the final assembled product shall be provided for Government review and approval. As-run copies of the ATP with appropriate results, data, and quality control approvals shall be provided as part of the test results documentation.

The Contractor shall comply with NASA-STD- 8739.8, Software Assurance Standard, when detailed Software Product Assurance/Independent Verification and Validation is required.

4.7 Analysis

The contractor shall perform and support analyses during all phases of development. Types of analyses include thermal, vibroacoustic, computational fluid dynamics, stress, loads, fracture, electro-magnetic compatibility, electrical power distribution, sneak circuit and computer system performance.

4.8 Delivery and Installation

The Contractor shall prepare and deliver turnover documentation, including Acceptance Data Packages, for transfer of operations and maintenance responsibilities for completed components or systems to the customer.

The Contractor shall install hardware and/or software systems, as required. Coordination of operational constraints may be necessary.

4.9 Craft Labor

The Contractor shall provide craft labor support for activities including fabrication, modification, and maintenance of end items, as well as installation and connection of equipment; including verification testing and validation testing support.

The contractor shall provide on-call craft labor support to be scheduled when required. Craft labor will be managed on an hourly, daily, or weekly basis as required to perform the necessary work.

The Contractor shall provide technical and management support for the craft labor efforts, such as logistics, field engineering, scheduling, cost estimating and tracking, shop drawings, test procedures, and as built documentation.

4.10 Sustaining Engineering

The Contractor shall provide sustaining engineering of ground systems and ground support equipment hardware and software, including but not limited to minor design changes and resultant documentation, as required by NASA/KSC. These services may include software engineering, laboratory tests, and design problem resolution for components or systems previously turned over to the customer. Sustaining engineering is the primary responsibility of the operations and maintenance organization, but this capability is required for non-recurring analysis, trouble shooting and modifications in the case where the O&M organization needs to reach back for deeper knowledge that exist with the original system design organization.

4.11 Expert Troubleshooting Services

The Contractor shall provide expert troubleshooting services including, but are not limited to, non-routine problem solving, application support, lab and field testing, engineering analysis/prediction, data analysis, and fault diagnosis for the specialty areas listed in section 4.0.

5.0 SPACE FLIGHT SYSTEMS SUSTAINING ENGINEERING SUPPORT

The Contractor shall perform sustaining engineering functions for space flight hardware and software systems and associated interfacing ground and support systems. The Contractor shall perform primary and support engineering roles under direction from NASA for launch vehicles, spacecrafts, and payloads.

5.1 Space Flight Systems

The Contractor shall investigate, evaluate, and perform analysis on the systems of NASA's launch vehicles, spacecrafts, and payloads to verify compliance with applicable requirements. The Contractor shall perform insight for the functions of design, development, analyses, manufacturing, verification, validation, assembly, integration, testing, checkout, launch operations, on-orbit mission operations, recovery operations, and post flight review.

The Contractor shall investigate and evaluate ground support systems and equipment interfacing with launch vehicles, spacecrafts, and payloads at processing facilities and launch complexes, as required to effectively perform/support flight system sustaining functions.

The Contractor shall assess launch vehicle, spacecraft, and payload non-standard mission specific items for compliance with applicable requirements.

The Contractor shall provide rapid, accurate, and complete assessment of launch vehicle, spacecraft, and payload systems issues and provide documentation/notification to the applicable NASA Engineering official so NASA can provide prompt approval of mission unique items and a knowledgeable "go/no-go" decision for NASA missions. Applicable NASA Engineering officials may include: Subsystem Managers, System Engineers, and Chief Engineers.

The Contractor shall participate in NASA and stakeholder meetings to provide technical evaluations and recommendations. These meetings include, but are not limited to: Integrated Product Team (IPT) meetings, Technical Interchange Meetings (TIM), Preliminary Design Reviews (PDR), Critical Design Reviews (CDR), Design Certification Reviews (DCR), Quarterly Program Reviews (QPR), Safety Review meetings, Space Flight Readiness Reviews, and Launch Readiness Reviews.

5.1.1 Space Flight Systems Analysis

The Contractor shall provide documented reviews and assessments of analytical items throughout the build cycle for each assigned launch vehicle, spacecraft, and payload and life cycle for each NASA mission. Evaluation of these items may require the Contractor to perform an independent analysis.

The Contractor shall provide documented evaluations and recommendations to NASA such that corrective actions can be

accomplished. The analytical areas that shall be covered include the following:

- Loads and Structural Dynamics
- Dynamic Environments
- Stress
- Flight Design
- Flight Software
- Controls and Stability
- Integrated Avionics
- Integrated Propulsion
- Safety
- RF System Performance
- Thermal/Thermodynamics
- Electromagnetic Compatibility
- CFD/Aerodynamics

The Contractor shall provide specific technical expertise for all of the disciplines listed above to include the ability to:

- Develop and create complex launch vehicle, spacecraft, and payload models
- Perform analysis on these models using relevant software
- Modify or update design center and/or Original Equipment Manufacturer (OEM) supplied analytical software and models as required
- Understand the NASA tools and models such that input and output files can be reviewed efficiently and accurately
- Review incoming reports and perform analytical checks as required.

5.1.2 Space Flight Systems Engineering and Integration

The Contractor shall evaluate and provide technical assessments of flight hardware and software systems and, as required, interfacing ground systems for compliance with applicable requirements and robustness in the areas of performance, safety, reliability, and quality.

The Contractor shall perform, obtain, assess and/or provide the following for space flight systems: system analysis, system testing, failure trend analysis, design change analysis, design change engineering, manufacturing processes, vendor qualifications, qualification testing, acceptance testing, hardware certification processes, corrective action processes, operational testing, flight commit requirements, flight performance, and post flight assessment.

The Contractor shall support engineering insight into space flight system production activities at component level vendors, subsystem vendors, launch vehicle providers, and spacecraft providers.

The Contractor shall have the ability to support engineering insight into space flight systems design and development activities at design centers and OEMs.

The Contractor shall participate in and assess compliance with mission cleanliness requirements in processing facilities, during transportation and integration, and in the spacecraft and payload environments.

The Contractor shall provide space flight systems expertise including, but not limited to:

Electrical/Avionics Engineering: electrical wiring avionics boxes, guidance and control systems, vehicle instrumentation, vehicle telemetry, vehicle Radio Frequency (RF) systems, vehicle power systems, data acquisition/handling systems and Ground Launch Control Software, space flight constants and program loads, and electrical/avionics ground support equipment.

Mechanical/Fluids/Structural Engineering: structures, materials and processes, payload adapters, mechanical separation systems, pneumatics systems, hydraulics systems, liquid and solid propulsion systems, ordnance systems, contamination control methods, and mechanical/fluids/structural ground support equipment.

5.2 Special Studies

The Contractor shall perform special studies, projects, and analyses in support of NASA launch vehicles, spacecraft, and payloads. These activities include, but are not limited to:

- Advance planning and feasibility studies
- Analyses in support of change requirements
- Development, fabrication, and test of hardware/software to support planning studies or special tests
- Mission unique studies
- Technology applications
- Safety and mission assurance
- Processing and launch of hazardous payloads

The Contractor shall plan, implement and provide reports documenting results at the conclusion of the study efforts.

6.0 OPERATIONS TECHNOLOGY DEVELOPMENT

The Contractor shall perform research and development (R&D) for operations technology as identified in the KSC Technology Needs List, Appendix XX. The scope of

the operations R&D activity is primarily at Technology Readiness Levels (TRL) 3 thru 6, which advances technology from an analytical and experimental proof-of-concept to a prototype system demonstration in a relevant environment as per Appendix XX.

The Contractor shall identify, evaluate and/or develop technology for immediate response to operational issues.

The Contractor shall identify, evaluate and/or develop specific technologies to reduce life cycle cost, improve the safety, reliability, and enhance performance of existing and near future operational systems.

The Contractor shall identify, evaluate and/or develop technologies for future areas of operations that will assist KSC in accomplishing its mission.

The Contractor shall propose technology projects consistent with KSC's technology needs. These projects may have the potential of being further developed with the funding of a targeted customer, once the TRL is raised.

The Contractor shall perform research and development (R&D) for operations technology activities including: concept formulation, analysis and experimental proof-of-concept; component and/or prototype validation in laboratory and relevant environments; modeling in the laboratory or prototype demonstration in relevant environments. The Contractor shall meet the requirements of NPR 7120.8, NASA Research and Technology Program and Project Requirements, when required.

The Contractor shall support KSC proposal submittals to Agency and other Government Agency solicitations by providing the following: expertise in producing winning proposals, investigators to complement NASA investigators, technical input during proposal preparation, technical writing services and production of final proposal and cognizance release of R&D solicitations.

7.0 TECHNICAL SERVICES

The Contractor shall provide the following types of services, as defined by individual Task Orders:

7.1 Software Tools Development and System Administration

The Contractor shall have the capability to develop and maintain user access, computer/network security, user interfaces, macros, and software programs to operate laboratory equipment and enhance the software applications used to produce reports, schedules, databases, and other documentation referenced throughout the PWS.

7.2 Technical Writing, Reports, and Documentation

The Contractor shall provide technical writing, editing, and technical illustration of various engineering and technology documents, reports, operation and

maintenance manuals, strategic plans and presentations related to contract activities.

The Contractor shall develop and maintain and/or support the development and maintenance of Engineering Standards, Specifications, and Procedures as required. Activities include research, writing, review, editing, typing, and proofreading to ensure production of a complete document ready for approval and reproduction.

For tasked research and development activities, the Contractor shall provide the required technology reports and enter information in required databases when appropriate, such as the Technology Inventory Database Reports or the KSC Technology Research & Development Reports.

7.3 Multimedia and Graphic Design

The Contractor shall provide multimedia and graphic design, development, and related support. This includes graphic and presentation design and development, photographic and video support, and web site design and development.

7.4 CAD–CAE and Simulation

The Contractor shall provide Computer Aided Design (CAD), Computer Aided Engineering (CAE), and simulation.

The Contractor shall prepare or assist in preparing engineering drawings, block diagrams, schematics, printed circuit layouts, parts lists, layouts, and other associated documentation. Proficiency with Government provided software tools such as I-DEAS, Pro/Engineer, and Autocad is essential.

All applicable documentation shall be prepared in accordance with GP-435 (Engineering Drawing Practices) and KSC-DF-107 (Technical Documentation Style Guide).

7.5 Program/Project Management and Support Services

The Contractor shall provide project management and program/project management support.

7.5.1 Project Management

Task Orders will require planning, tracking, and reporting of cost, schedule, and technical performance, as defined in section 2.0 and the Data Requirements List (DRLs) specified in Appendix A.

Task Orders may require a wide range of project management responsibilities, depending on the type of work effort and the amount and type of collaboration with NASA. Some Task Orders will relate to a task, or collection of tasks, requiring no specific project management. Some Task Orders effort may be identified as official NASA projects to be managed in

accordance with the NPR 7120.5 (NASA Space Flight Program and Project Management Requirements), or NPR 7120.7 (NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements), or 7120.8 (NASA Research and Technology Program and Project Management Requirements). Many Task Orders will fall somewhere between these extremes. Specific project management responsibility, if required, will be identified on the Task Order.

Normally, a NASA Project Manager will have overall responsibility for a NASA project, including compliance with NASA Program and Project Management requirements, as applicable. Under special circumstances, the Contractor may be assigned Project Management responsibility for a NASA project.

The Contractor shall manage assigned projects in a manner that allows for completion of project objectives within the planned schedule, cost and technical baselines.

7.5.2 Program/Project Management Support

The Contractor shall provide program/project management support including, but not limited to: systems engineering and integration, cost estimating, earned value management, metrics, project planning, project formulation, requirements generation, resource allocations, spending plans, budgets, literature searches, administration of strategic planning working groups, project proposals, market research, configuration management, work breakdown structures, scheduling, schedule analysis, field surveys, providing data, development of lessons learned and support for reviews, special briefings and presentations.

The Contractor shall have proficiency with Government provided software tools, including but not limited to: Primavera, Windchill, and Cradle.

7.6 Technology Commercialization and Outreach

The Contractor shall plan and implement commercialization, and technology outreach activities including special projects, demonstrations, displays, seminars, and presentations.

The Contractor shall develop outreach materials including brochures, multi-media products, exhibit materials, and newsletters. These materials shall be disseminated through activities including web based and educational forums, and other public events.

The Contractor shall provide support and participate in the Government technology transfer/commercialization efforts. This includes expertise to support the New Technology reporting, evaluation and commercialization processes, and commercialization training and awareness activities at NASA/KSC for all KSC

innovator employees as well as expertise to support the formation and management of partnerships related to commercialization and development of new technology.

The Contractor shall perform data management activities for NASA/KSC data into the NASA Commercialization Information System, including NASA TechTracS.

7.7 Logistics Services

The Contractor shall perform integrated logistics services to include engineering, property management, ground material procurement, receiving and inspection, inventory management, storage, maintenance, kitting, staging and issuance, packaging and handling, shipping and transportation, and disposal for assigned hardware.

The Contractor shall ensure compliance with all applicable government forms and procedures relative to the handling, packaging and transporting of government property.

7.8 Host Services

The Contractor shall provide host services to Government sponsored visitors. This includes: gathering and documenting support requirements; developing and coordinating unique protocols in support of research activities; assuring readiness of laboratories, equipment, and specialized logistics; providing personnel escorts when required by security regulations; and coordinating related activities conducted in KSC facilities.

The Contractor shall provide technical conference planning and execution.

7.9 Technical Reviews, Boards, and Panel Support

The Contractor shall coordinate technical meetings, prepare system documentation, provide mission related products, and provide administrative support to program reviews, design reviews, control boards, program/project teams, Integrated Product Teams (IPT), and panels.

The Contractor shall provide secretarial function support to include: publish/distribute preliminary and final versions of meeting minutes/actions, prepare agendas, coordinate meet-me numbers for teleconferences, arrange facility accommodations and presentation equipment, reproduce meeting materials, and record attendance.

The Contractor shall provide and maintain the tools required to perform technical reviews, boards, and panels, as required. Such tools may include multimedia, video, network, and work station equipment.

7.10 Laboratories and Developmental Shops Services

The Contractor shall perform technical support services within laboratories and developmental shops, as identified in Appendix C. Services shall support resident laboratory locations or in-situ such as KSC, Cape Canaveral Air Force Station (CCAFS), and Patrick Air Force Base (PAFB), and other entities as assigned. Services for assigned laboratories and developmental shops include any or all of the following: research, development, prototyping, testing, analysis, and minor modifications within the assigned areas.

The Contractor shall provide documentation in accordance with the customer's requirements for work performed.

7.10.1 Program-Support Services

The Contractor shall plan, conduct, and provide recurring customer required research, development, prototyping, testing, and analysis services.

7.10.2 Special Services

The Contractor shall plan, conduct, and provide non-recurring customer required research, development, prototyping, testing, and analysis services as required on a special basis.

7.10.3 Minor Modifications

The Contractor shall perform modernization and improvement evaluations of assigned facilities, laboratories and developmental shops as directed by NASA.

The Contractor shall perform minor system modernization and upgrades within laboratories and developmental shops, and other work areas as directed by NASA.

The Contractor shall meet the requirements of NPR 8820.2 (Facility Project Requirements), and KSC-KDP-P-1319 (Facility Project Approval and Implementation), for all work performed on facilities or facility systems.